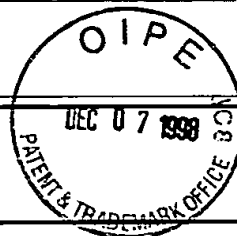


**TRANSMITTAL LETTER  
(General - Patent Pending)**

Docket No.  
GGD-101

In Re Application Of: **Francois Menard**



#5

Serial No.  
09/154,431

Filing Date  
September 16, 1998

Examiner

Group Art Unit

Title:

**APPARATUS AND METHOD TO USE A CONVENTIONAL TELEPHONE SET TO MAKE TELEPHONE CALLS  
PACKET NETWORK**

**TO THE ASSISTANT COMMISSIONER FOR PATENTS:**

Transmitted herewith is:

a certified copy of the Canadian application to which priority is claimed under 35 U.S.C. 119, Canadian Serial Number 2,215,681, filed September 16, 1997.

in the above identified application.

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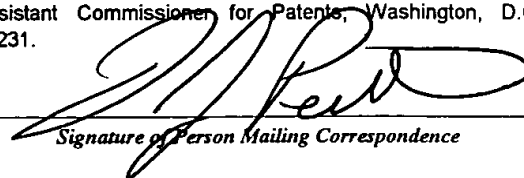


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Dated: **December 2, 1998**

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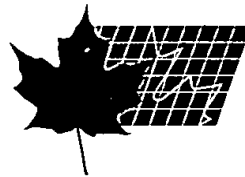


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Specification and Drawings, as originally filed, with Application for Patent Serial No:  
**2,215,681**, on September 16, 1997, by **MEDIATREX PERIPHERALS INC.**, assignee of  
François Ménard and Louis Bélanger, for "Apparatus and Method to Use a Conventional  
Telephone Set to Make Telephone Calls on a Packet Network".

  
Agent certificateur/Certifying Officer

September 28, 1998  
Date

ABSTRACT OF THE DISCLOSURE

An apparatus and method for routing telephone calls between conventional analog telephones, conventional telephone lines and packet network access devices that are all located on the premises of the customer, is presented. The apparatus is a small sealed enclosure with a plurality of interfaces including conventional telephone line interfaces, conventional telephone interfaces and packet network interfaces. Use is made of an embedded software agent located in the apparatus to decide which interfaces to use on the apparatus for completing telephone calls. The software agent takes decisions based on a set of routing rules that are determined by a combination of client-side and server-side processes. The complete operation of the apparatus is entirely transparent to the subscriber.

**TITLE OF THE INVENTION**

Apparatus and method to use a conventional telephone set to make telephone calls on a packet network.

5

**FIELD OF THE INVENTION**

The present invention relates to packet networks. More specifically, the present invention is concerned with a method and an apparatus to use a conventional telephone set to make telephone calls on a packet network.

10

**BACKGROUND OF THE INVENTION**

The prior art is replete with software enabling a first user to establish a telephone-like conversation with a second user running the same software.

15

These software usually run on personal computers equipped with microphones to capture the sounds and with sound cards to reproduce the sounds from the other user. The software therefore captures the sound from a first user, digitizes it, compresses it, and forwards it to the Internet Protocol address (IP address) of the second user. The sounds is then uncompressed, transferred back to analog sound by the sound card and reproduced on the premises of the second user. Of course, these steps are performed bidirectionnally to result in a full duplex connection.

20

25

The drawbacks of the above mentioned software system are multiple. For example, a dedicated PC must be used as a telephone, both users must be similarly equipped and running the same software and it is not possible to reach users equipped with conventional  
5 telephones.

### **OBJECTS OF THE INVENTION**

An object of the present invention is therefore to provide  
10 an improved apparatus and method for transmitting live sounds over a packet network.

Another object of the invention is to provide an apparatus and a method to use a conventional telephone set to make  
15 telephone calls on a packet network.

Other objects, advantages and features of the present invention will become more apparent upon reading of the following non restrictive description of preferred embodiments thereof, given by way of  
20 example only with reference to the accompanying drawings.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

In the appended drawings:  
25

Figure 1 is a schematized block diagram illustrating the various components of a telephone to packet adaptor according to an embodiment of the present invention.

Figure 2 is a schematized block diagram illustrating a packet network where users are provided with telephone to packet adaptors according to an embodiment of the present invention;

5                    Figure 3 is a flow diagram illustrating the general steps taken to establish a communication between user 2 and user 1 of Figure 2;

10                   Figure 4 is a flow diagram illustrating the general steps taken to establish a communication between user 1 and user 2 of Figure 2;

15                   Figure 5 is a flow diagram illustrating the general steps taken to establish a communication between one of users 1 or 2 and user 3 of Figure 2; and

Figure 6 is a block diagram showing another way of illustrating the present invention.

20                   **DESCRIPTION OF THE PREFERRED EMBODIMENT**

Figure 1 of the appended drawings illustrates a block diagram of a full duplex telephone to packet adaptor 10 according to an embodiment of the present invention.

25

The adaptor 10 includes a telephone input/output (IO) port 12 to which a conventional telephone (not shown) may be connected, a telephone line IO port 14 to which a telephone line (not shown) may be

connected and a cable IO port 16 to which a conventional television cable (not shown) may optionally be connected.

5           The adaptor 10 electronic circuitry generally includes an analog to digital (A/D) and a digital to analog (D/A) full duplex interface 18 connected to a controller circuit 20, a speech encoder/decoder 22 connected to the controller circuit 20, a telephone interface 24 interconnecting the IO port 14 and the controller circuit 20 and a cable interface 26 interconnecting the IO port 16 and the controller circuit 20.

10

The controller circuit 20 is provided with a central processing unit (CPU) and sufficient memory to store a software agent program and other data stored in databases.

15           The speech encoder/decoder 22 includes the required circuitry to preform digital speech encoding and decoding to decrease the bandwidth required to transfer the information to a user to another and to recuperate the complete information after the transfer.

20           It is believed within the reach of one skilled in the art to provide adequate electronic circuitry for the elements 18-26 described hereinabove.

25           Turning now to Figure 2 of the appended drawings, a packet network 30 (hereinafter referred to as "the internet") in which the users are equipped with the telephone to packet adaptor 10 of Figure 1 is illustrated. Figure 2 will be further described hereinafter with a view to illustrate some of the various possibilities of the telephone to packet adaptor 10 of Figure 1.

A first user 32 is connected to the internet 30 via a first service provider 34 and a telephone line 36. The first service provider 34 has a conventional internet server 38 provided with conventional modems (not shown) to interconnect its clients, for example first user 32, to the internet. The first user 32 has a conventional modem 40, a telephone to packet adaptor 10a and a conventional telephone 42. It is to be noted that the cable IO port 16 (not shown) of the adaptor 10a is not used.

Figure 2 also illustrates a second service provider 44 connected to the internet via an internet server 46 and including a telephone to packet adaptor 10b interconnecting the internet server 46 and a telephone line 48 the purpose of which will be described hereinafter with reference to Figure 5.

The internet 30 is also connected to a server 50 of a cable company 52 providing internet services to its clients, for example second user 54, via a conventional television cable 58 connected to the server 50 via adequate circuitry (not shown) known in the art.

The second user 54 is equipped with a cable modem 60 connected to the conventional television cable 58 and a telephone to packet adaptor 10c interconnecting the cable modem 60 and a conventional telephone 62. The telephone to packet adaptor 10c is also connected to a telephone line 64.

Finally, Figure 2 also illustrates a third user 66 equipped with a conventional telephone 68 connected to a conventional telephone line 70.



Turning now to Figures 3-5, three different methods of use of the telephone to packet adaptor 10 will be described.

Figure 3 generally illustrates the steps taken when the  
5 second user 54 wants to reach another person.

After the telephone to packet adaptor 10c is started  
(step 100) and initialized (step 102), the system waits until the second  
10 user 54 picks up the handset and dials a telephone number (step 104).

The telephone to packet adaptor 10c then verifies if the  
dialled telephone number is present in a database contained in the  
controller circuit 20 (Figure 1) (Step 106). If it is not the case, the  
telephone to packet adaptor connects the telephone 62 to the telephone  
15 line 64 and dials the telephone number (step 108) which means that the  
number dialled by the second user does not correspond to a known user  
of the present invention and that the telephone number must be  
conventionally dialled over a telephone line to establish the connection.

20 If the dialled number is present in the database, the  
controller 20 then determines if the IP address corresponding to this  
telephone number is in its database (step 110). If it is not the case, the  
telephone to packet adaptor 10c interrogates the internet server 50 of the  
cable company 52 (or any other server having a table of the IP address  
25 vs telephone numbers) to find the required IP address (step 112). When  
this is done, the telephone to packet adaptor 10c establishes the  
connection between the second user 54 and the other user (for example  
the first user 32) (step 114). The two connected users may then  
communicate normally in full duplex since the conversation is

bidirectionally digitized, transformed into packets and transferred via the internet 30 to the other user where it is converted back into an analog signal and supplied to the handset.

5                   The telephone to packet adaptor 10c then waits until the communication is broken (step 116) and then returns to step 104.

                  An advantage of the above mentioned method is that the second user 54 may transparently connect to both conventional  
10           telephone users and users of the present invention.

                  Figure 4 of the appended drawings generally illustrates the steps taken when the first user 32 wants to reach another person.

15                   Steps 200, 202, 204, 206, 208, 210, 214 and 216 are respectively identical to steps 100, 102, 104, 106, 108, 110, 114 and 116 of Figure 3.

20                   Since the first user is not connected to the internet via a cable company, the internet server 38 of the first internet service provider 34 (or any other server having a table of the IP address vs telephone numbers) is interrogated in step 212.

25                   A step 218 has been added between step 206 and 210 to instruct the modem 40 to connect to the service provider 34.

                  The telephone 42 is therefore connected to the telephone line directly if a conventional telephone call is requested and

to the internet via the first service provider 34 if a telephone call to another user of the present invention is requested.

Finally, Figure 5 of the appended drawings illustrates  
5 another use of the telephone to packet adaptor 10 of Figure 1. This application advantageous to reduce the long distance costs of the user.

The general principle is to detect if the telephone  
number dialled by the user is a long distance number and to do a routing  
10 of the call to a service provider (for example the second service provider 44 in Figure 1) in the area of the telephone number to therefore prevent any long distance charges to the user if it is so. Of course the service provider 44 is equipped with a telephone to packet adaptor 10b that may dial a local number via a telephone line 48.

15 Steps 300, 302, 304, 308 and 316 are identical to the corresponding steps 100, 102, 104, 108 and 116 of Figure 1 and described hereinabove.

20 In step 306, the telephone to packet adaptor determines if the telephone number dialled is a long distance number. If this is not the case, step 308 is done as mentioned above.

If the telephone number dialled is a long distance  
25 number (for example the telephone number of the third user 66), the telephone to packet adaptor searches a database (located in the controller circuit or in an internet server) to find the IP address of a service provider equipped with a telephone to packet adaptor (for example the

second service provider 44) in the area of the telephone number dialled (step 320).

5           The telephone to packet adaptor then connects with this service provider 44 gives its own IP address and the telephone number of the third user 66 (step 322).

10           The telephone to packet adaptor 10b of the second service provider 44 then takes the telephone line 48 and dials the received telephone number to establish the communication with the third user.

15           Again, the use of the telephone to packet adaptor 10 is transparent to the user since only one number is dialled. Also, this application enables the user of the present invention to communicate with a user of a conventional telephone.

20           It is to be noted that it would also be possible to make a local call to a user of a conventional telephone by using a local service provider equipped with a telephone to packet adaptor to do local calls. This way, the second user 54, for example, would not require a conventional telephone line.

25           It is to be noted that conventional and/or cable modems could be integrated with the telephone to packet adaptor 10.

          It is also to be noted that the telephone to packet adaptor 10 also includes a dial tone generator (not shown) to locally simulate the conventional dial tone in the handset.

As will be easily understood by one skilled in the art, the software running in the telephone to packet adaptor 10 may advantageously include supplementary features. For example, once an internet server is interrogated to link an IP address to a telephone  
5 number, the control circuit 20 may keep this information in a database for future reference in view of decreasing the required connection time. Similarly, speed dial numbers may be assigned to such kept IP addresses.

10 Also, it is to be noted that the flow diagrams illustrated in Figures 3-5 are schematized and that actual flow diagrams would be a lot more complex and would include other rules for routing the calls. For example, if the telephone to packet adaptor detects that an emergency number (911 in North America) has been dialled it will  
15 automatically take the telephone line and dial this emergency number.

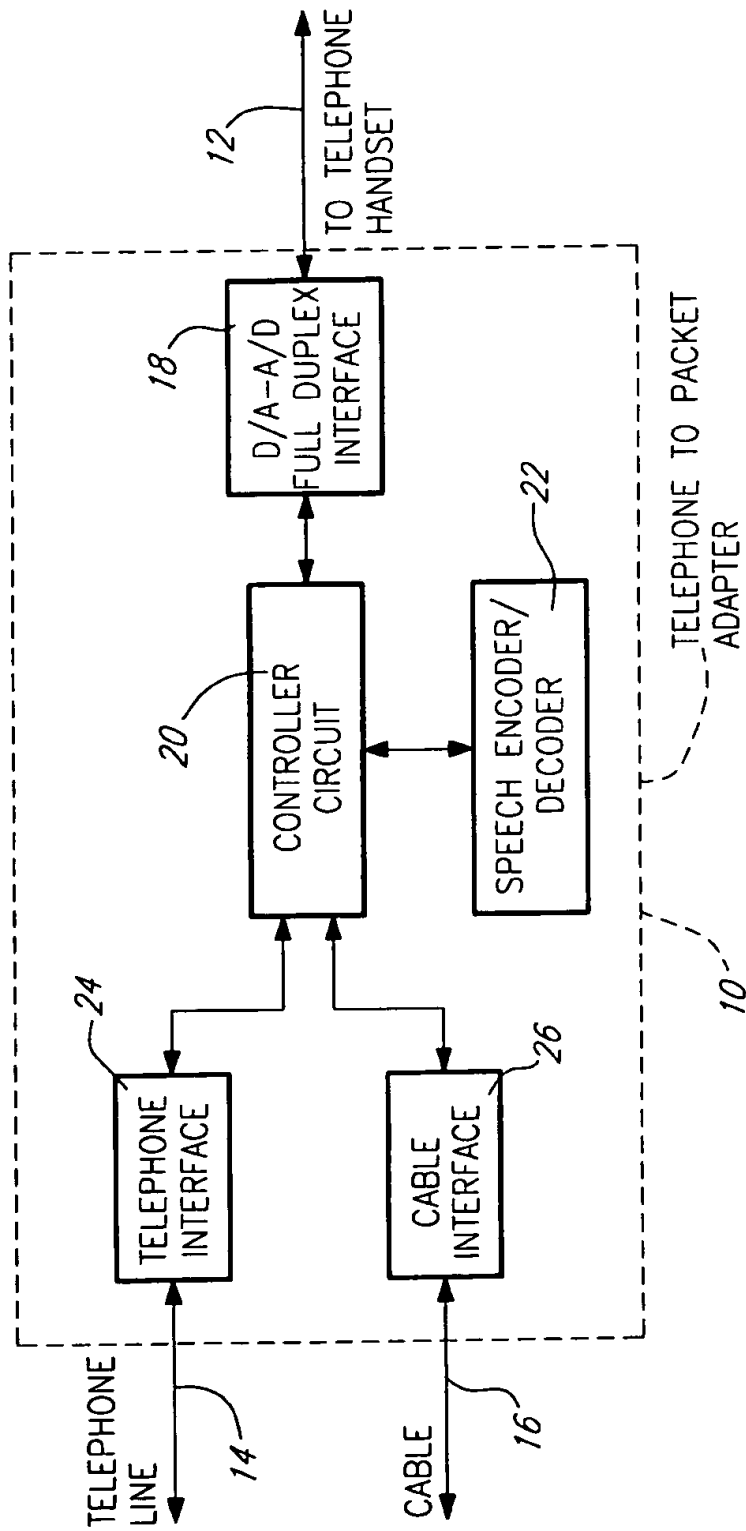
Turning now to Figure 6 that shows another way of illustrating the present invention, an embedded software agent is used to compute a route based on information acquired or stored locally as well  
20 as information acquired from a network server. A calling method is derived from these rules and is used to determine which interfaces will be involved in the process of completing the call. The appropriate route is triggered from an embedded software agent running in a central processing unit located in the apparatus. The embedded software agent  
25 may decide to exchange route information with an intelligence server located on the network in order to "remember" this information in further calls. The embedded software agent will decide when it is appropriate to select whether to use the packet network interface or the telephone network interface to carry through a call. This method permits of using a

dedicated connexion to a packet network in the home as a mean for automatically diverting some telephone calls through a least cost route.

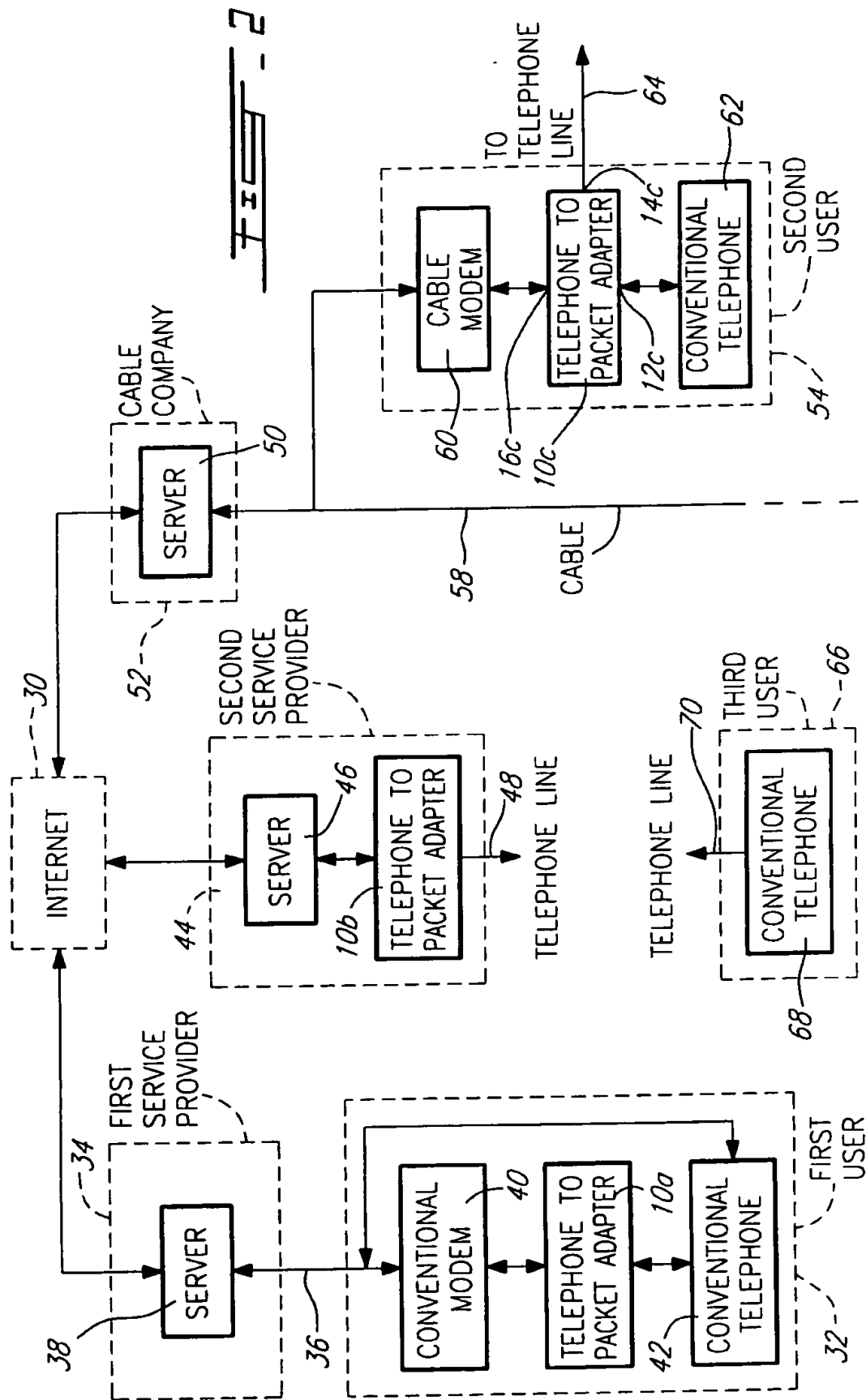
5           Although the present invention has been described hereinabove by way of preferred embodiments thereof, it can be modified, without departing from the spirit and nature of the subject invention as defined in the appended claims.

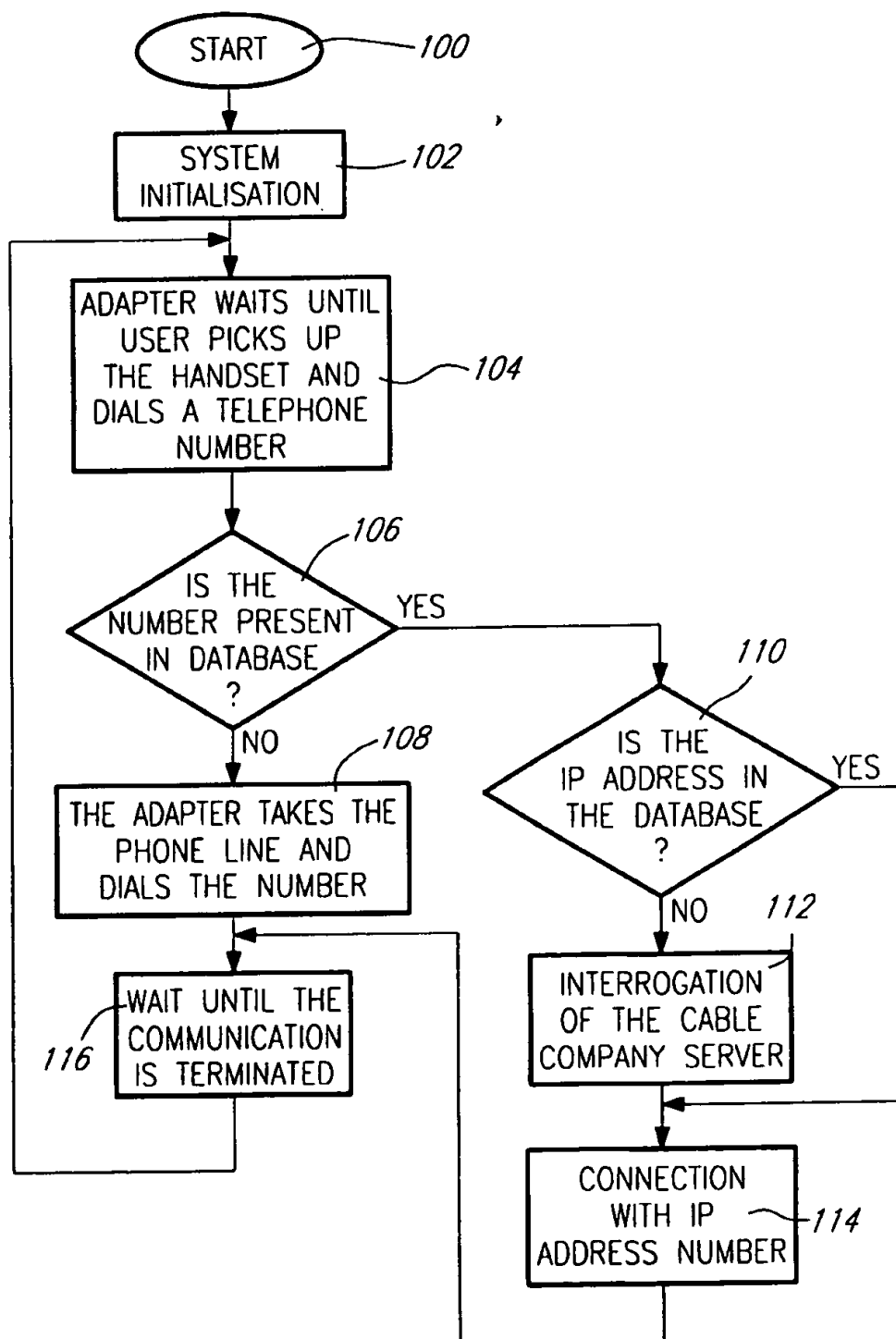
WHAT IS CLAIMED IS:

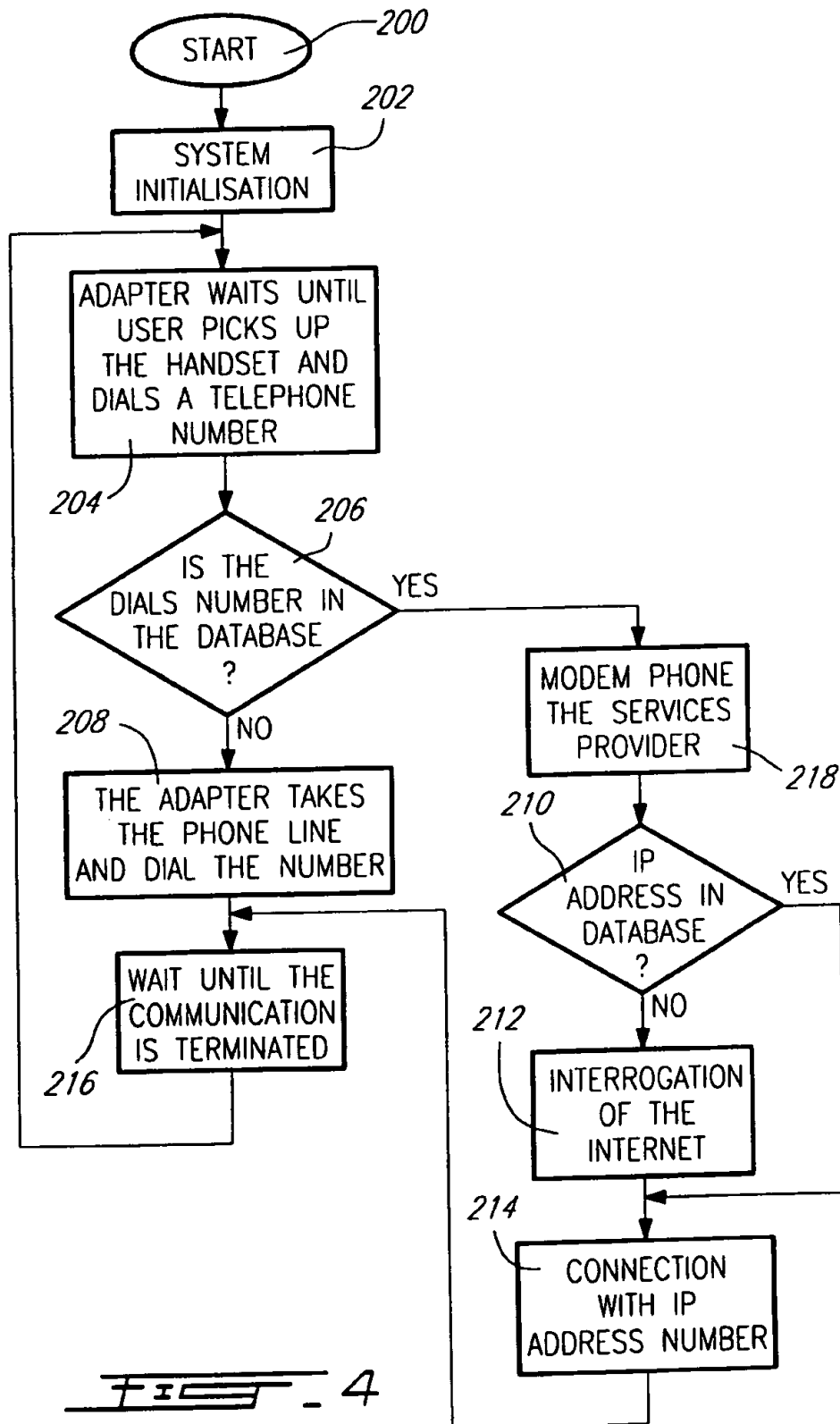
1. A telephone to packet adaptor comprising:
  - a conventional telephone line interface;
  - 5 a conventional telephone interface;
  - a packet network interface;
  - a controller circuit interconnecting said conventional telephone line, conventional telephone and packet network interfaces;
  - said controller circuit running an agent software for routing the telephone
  - 10 line interface to either said conventional telephone line interface and said packet network interface depending on predetermined rules.
2. A method of operating a telephone to packet adaptor comprising:
  - 15 a conventional telephone line interface;
  - a conventional telephone interface;
  - a packet network interface;
  - a controller circuit interconnecting said conventional telephone line, conventional telephone and packet network interfaces;
  - 20 said method comprising the step of:
    - running an agent software for routing the telephone line interface to either said conventional telephone line interface and said packet network interface depending on predetermined rules.

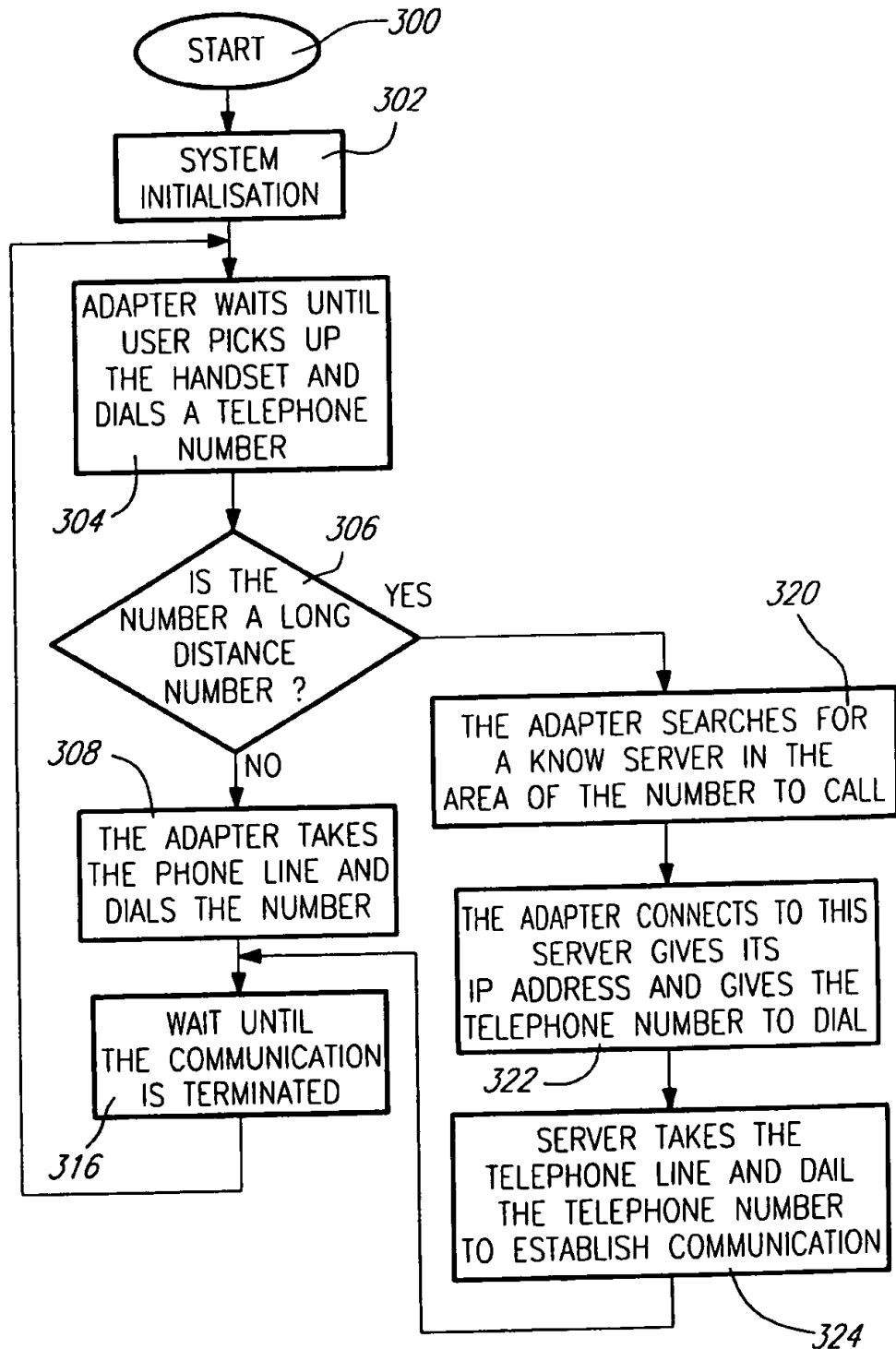
FIG. 1









FIG. 5

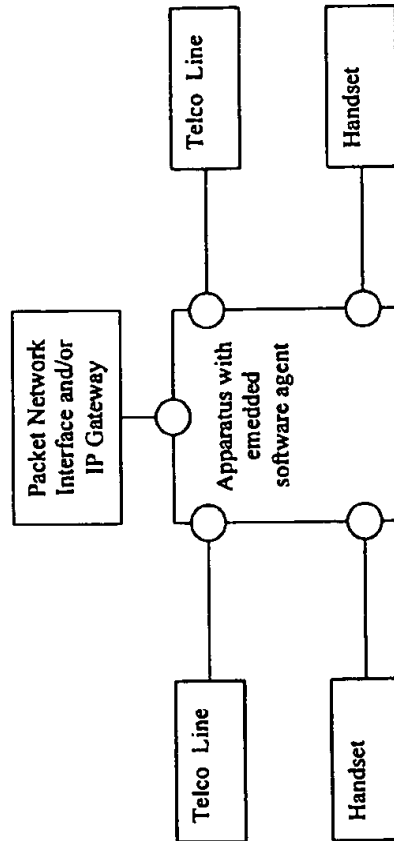


FIG. 6